

at least 85% of said fibers in said bundles have a length of between 5 - 100 mm; wherein
said fibers in said fiber bundles are held together with a substantially water insoluble sizing; and wherein
said inner layer is formed of at least one of inexpensive fibers, scrap fibers, and material of significantly lower density than said outer layers.

42. (NEW) A composite product as recited in claim 41, wherein at least 10% of the fibers in said fiber bundles comprise reinforcement fibers selected from the group consisting essentially of glass, aramid, carbon, polypropylene, acrylic, and PET fibers, and combinations thereof.

43. (NEW) A composite product as recited in claim 41, wherein at least 50% of the fibers in said fiber bundles comprise glass fibers.

44. (NEW) A composite product as recited in claim 42, wherein at least 85% of said fibers in said fiber bundles are selected from said group.

45. (NEW) A composite product as recited in claim 41, wherein at least 85% of said fibers in said fiber bundles have a length of between about 7 - 50 mm.

46. (NEW) A composite product as recited in claim 41, wherein said mat has a density of between about 50-900 g/m².

47. (NEW) A composite product as recited in claim 41, wherein at least 85% of said fibers in said fiber bundles have between 10 - 450 fibers per bundle and a length substantially the same as the length of said fiber bundle, and wherein the sizing is epoxy resin or PVOH.

48. (NEW) A composite product as in claim 41, wherein said mats have a substantially uniform density of less than 75 g/m².

49. (NEW) A composite product as in claim 41, wherein said mats have a substantially uniform density of between about 50-150 g/m².

50. (NEW) A composite product as in claim 49, wherein at least 60% of said fiber bundles have between 10-200 fibers per bundle, and wherein substantially all the fibers in the bundles are substantially straight.

51. (NEW) A non-woven mat of chopped strands, comprising:

a plurality of fibers disposed in a non-woven configuration to define a mat;
at least 20% of said fibers in fiber bundles having between 5-450 fibers per bundle and the length of said bundles being substantially the same as the lengths of the fibers forming said bundles;
at least 85% of said fibers of said fiber bundles have a diameter of between about 7-500 microns;
said fibers in said fiber bundles being held together with a substantially water insoluble sizing; wherein
said mat is manufactured by a foam process; and wherein
the mat has at least two layers, which exhibit different physical or chemical properties.

52. (NEW) A non-woven mat as recited in claim 51 wherein said mat is manufactured by using a foam process with a headbox to form at least two layers of said mat having substantially different properties which include at least one of different density, different material, different reinforcement threads, or different reinforcement webs.

53. (NEW) A non-woven mat as recited in claim 51 wherein, in at least one layer, at least 85% of said fibers in said bundles have a length of between 5-100 mm.

54. (NEW) A non-woven mat as recited in claim 51 wherein, in at least one layer, at least 85% of said fibers in said bundles have a diameter of between 7-35 microns.

55. (NEW) A non-woven mat as recited in claim 51 wherein, in at least one layer, at least 10% of the fibers in said fiber bundles comprise reinforcement fibers selected from the group consisting essentially of glass, aramid, carbon, polypropylene, acrylic, and PET fibers, and combinations thereof.

56. (NEW) A non-woven mat as recited in claim 51 wherein, in at least one layer, at least 50% of the fibers in said fiber bundles comprise glass fibers.

57. (NEW) A non-woven mat as recited in claim 51 wherein, in at least one layer, at least 85% of said fibers in said bundles have a length of between 5 - 100 mm, and wherein at least 85% of said fibers in said bundles have a diameter of between 7 - 35 microns.

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58. (NEW) A non-woven mat as recited in claim 55 wherein, in at least one layer, at least 85% of said fibers in said fiber bundles are selected from said group.

59. (NEW) A non-woven mat as recited in claim 51 wherein, in at least one layer, at least 85% of said fibers in said fiber bundles have a length of between about 7 - 50 mm.

60. (NEW) A non-woven mat as recited in claim 51 wherein, in at least one layer, said mat has a density of between about 50 - 900 g/m².

61. (NEW) A non-woven mat as recited in claim 51 wherein, in at least one layer, at least 85% of said fibers in said fiber bundles have between 10 - 450 fibers/bundle and a length substantially the same as the length of said fiber bundle, and a diameter between about 7 - 35 microns; and wherein the sizing is epoxy resin or PVOH.

62. (NEW) A non-woven mat as recited in claim 51 wherein substantially all the fibers in the bundles are substantially straight.
